

## Disclosures: None

## Background

R01 grant receipt is a hallmark of research career independence. However, from concept to funding, it takes 8-23 months to develop an NIH R01 grant application. In any given year, only about one quarter of all R01 funded grants are awarded to new investigators. Since 2003 the number of R01 applications have increased, however the NIH budget has remained flat. Consequently grant 'success' rates for all investigators, Early Stage investigators (ESIs) included, has been low. Therefore, to increase the likelihood of funding and be able to establish career independence, R01 grant resubmission is critical for early career scientists.

## Objectives

To examine R01 grant resubmission rates for NHLBI Early Stage Investigators (ESIs) and determine predictors of resubmission for ESI grants that were discussed.

## Methods

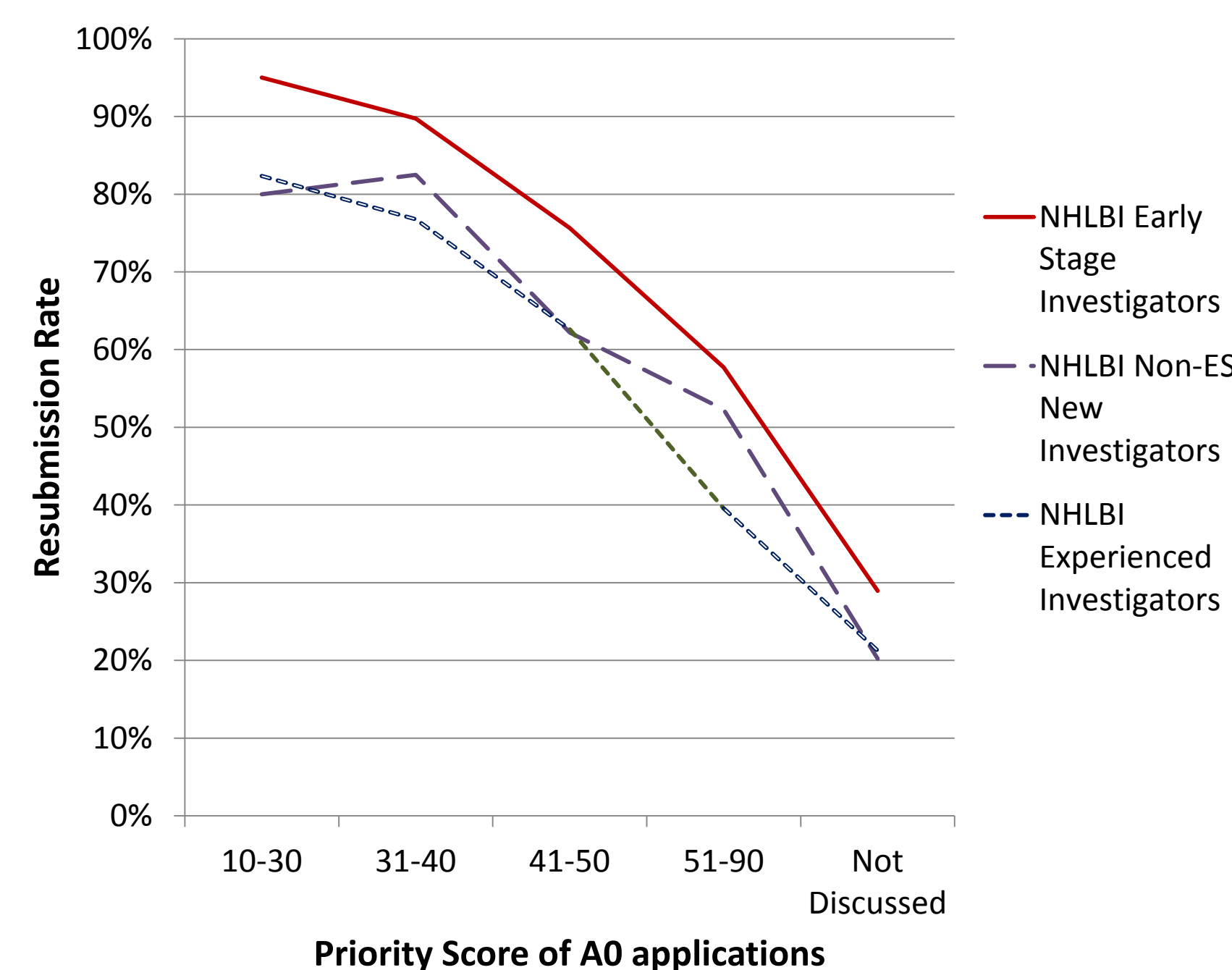
- **Data source:** NIH IMPAC II database
- **Data extracted:** FY 2010-2012 Type 1 R01 Applications
- **Extracted Variables:** Demographics, Applicant-, Grant-, Institutional-, and Peer review-based factors
- **Derived Variables:** mean-centered Age, and mean-centered grant criteria (approach, significance, innovation, investigator and environment) variables.
- **Primary outcome:** ESI resubmission rate and predictors thereof.
- We determined resubmission rates for all PI categories (Early Stage Investigators (ESI) Non-ESI New Investigators (NNI) and Established Investigators (EI)), and examined relationships between resubmission rates and all other variables of interests.
- We also used Random Forest methodology on the subset of ESI grants to identify top variables and to determine significant predictors.
- Given NHLBI policy of supporting ESIs up to 10 percentile points above the R01 payline, we also examined the NHLBI award rates for ESI grants funded in FY2010-2012.

- Total # of NIH FY2010-2012 R01 grants extracted: **34,240**
- ESI resubmission status was significantly associated with Mean-centered Age and all five mean-centered review criteria variables (Significance, Approach, Innovation, Investigator and Environment ),  $p < 0.001$ .

**Table 1: Number of Type 1 R01 grants and resubmission rates by investigator status**

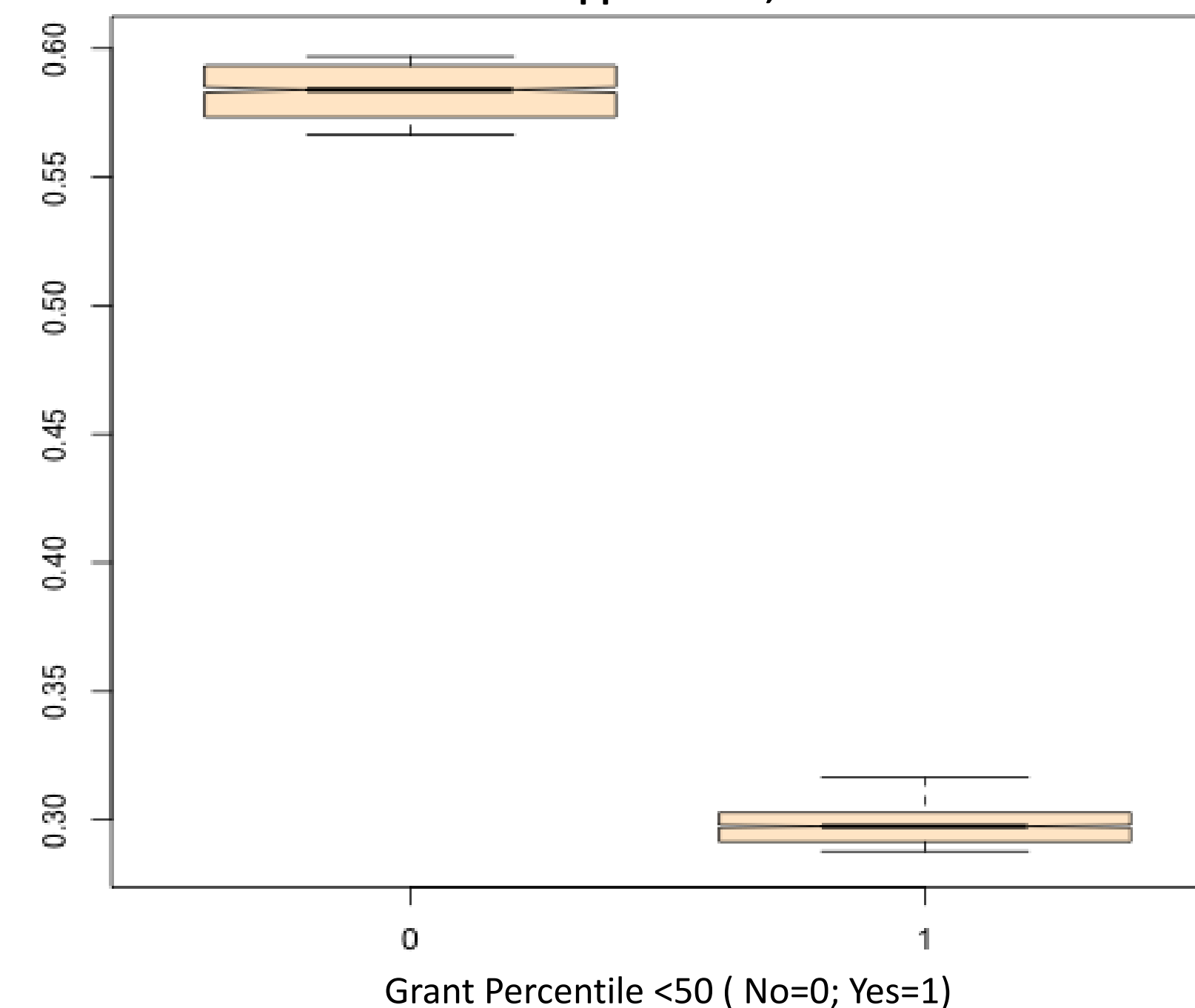
	Investigator Status			
	ESI	NNI	EI	Total
<b>Grant Factors</b>				
<b>Number of Grants Extracted</b>	833	813	2941	4587
<b>Number of Grants Resubmitted</b>	422	311	1207	1940
<b>Resubmission Rates</b>	50.7%	38.3%	41.0%	42.3%

**Figure 1: NHLBI Resubmission Rates by Priority Score and Experience of Investigator Type 1 Unsolicited A0 R01 Applications, FY 2010-2012**



## Results

**Figure 2: Probability of Not Resubmitting by Percentile Ranking <50 NHLBI Early Stage Investigator; A0 R01 Applications, FY 2010-2012**



**Table 2: NHLBI-funded ESI grants by fiscal year and application type ( Using only grant applications with A0 and A1 submitted between FY 2010-2012)**

Fiscal Year	Total A0 Applications	Total A0 (first try) Awards	Total A1 Applications (Resubmitted Applications)	Total A1 (Resubmission) Awards	Total # of Applications Submitted((A0 + A1)	Award Rate for Resubmitted Applications
2010	287	39	136	49	423	36.0%
2011	350	62	137	44	487	32.1%
2012	340	40	149	47	489	31.5%
Total	977	141	422	140	1399	33.2%

## Limitations

- The NIH IMPAC II database may not capture all the factors that influence ESI resubmission behavior and thus our analysis only captures select grant-related factors.

## Conclusions

- Compared to other investigators, NHLBI ESIs resubmitted R01 applications at a higher rate, at all impact score levels, during FY2010-2012.
- The probability of resubmitting was higher for grants that were percentile <50 compared to those that were not.
- The most significant predictor of resubmission among NHLBI ESI applicants was the grant's overall impact score, and not applicants' demographics.
- During FY2010-2012 almost half of all NHLBI R01 awards to ESIs were made to ESIs with resubmitted grants.
- NHLBI policy of supporting ESIs up to 10 percentile points above the R01 payline may have contributed to the higher resubmission and the favorable funding rates evidenced by the data.

**Figure 3: Random Forest Plot of Probability of Resubmission by Priority Score, NHLBI Early Stage Investigators Type I Unsolicited A0 R01 Applications (N=384) FY 2010-2012**

